DOCUMENT RESUME

ED 210 875 EC 140 677

AUTHOR Convey, John J.; Koelle, William H.
TITLE Improving the Prediction of Achievement of Deaf Adolescents by Modifying a Locus of Control and a Self-Concept Instrument.
PUB DATE Mar 81
NOTE 32p.; Paper presented at the Annual Meeting of the Eastern Educational Reseach Association (Philadelphia, PA, March 12-14, 1981).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; Adolescents; *Deafness; *Locus of Control; *Predictor Variables; Psychological Testing; Secondary Education; *Self Concept
IDENTIFIERS Piers Harris Childrens Self Concept Scale; Rotter Locus of Control Scale

ABSTRACT

Each item of the Rotter Locus of Control Scale and 28 of the 80 items of the Piers-Harris Children's Self Concept Scale were revised because of syntax or vocabulary that were considered to be problematic for deaf adolescents. The original and modified forms of each instrument were administered to 90 deaf adolescents from four residential schools. Better prediction was obtained for six of the nine subscales of the Stanford Achievement Test for the Hearing Impaired when scores from the modified forms of the instruments were used as predictors in place of scores from the original forms of the instruments. Other predictors were parent hearing status, sex, age, and school. Generally, parent hearing status and self concept were the most important predictors of the achievement subscales; however, the increase in prediction that occurred when the modified forms of the instruments were used as predictors was due particularly to the locus of control variable. Tables with statistical data are appended. (Author)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED210875

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

Improving the Prediction of Achievement of Deaf Adolescents by Modifying a Locus of Control and a Self-Concept Instrument

John J. Convey

Catholic University of America

and

William H. Koelle

Maryland Department of Education

Presented to the Annual Meeting of the Eastern Educational Research Association

Philadelphia, March 12-14, 1981

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
John Convey
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EC140677

Abstract

Each item of the Rotter Locus of Control Scale and 28 of the 80 items of the Piers-Harris Children's Self-Concept Scale were revised because of syntax or vocabulary that were considered to be problematic for deaf adolescents. The original and modified forms of each instrument were administered to 90 deaf adolescents from four residential schools. Better prediction was obtained for six of the nine subscales of the Stanford Achievement Test for the Hearing Impaired when scores from the modified forms of the instruments were used as predictors in place of scores from the original forms of the instruments. Other predictors were parent hearing status, sex, age, and school. Generally, parent hearing status and self-concept were the most important predictors of the achievement subscales; however, the increase in prediction that occurred when the modified forms of the instruments were used as predictors was due particularly to the locus of control variable.

Improving the Prediction of Achievement of Deaf Adolescents by Modifying a Locus of Control and a Self-Concept Instrument

Typically, the measurement of locus of control and self-concept of deaf subjects has been accomplished by using instruments that were developed with hearing subjects. Such instruments probably contain syntactical structures, and perhaps vocabulary, that have been found to be problematic for deaf subjects. Since measures of locus of control and self-concept often are used as predictors of other variables, particularly achievement, poorer prediction likely results when these measures are used with deaf subjects. The purpose of this study was to determine if the revision of a measure of locus of control and a measure of self-concept would improve the prediction of the achievement of deaf adolescents. The instruments were revised by rewriting items found to have problems with syntax that have been previously identified in the literature, or to have difficult vocabulary.

Many studies relating locus of control and self-concept to achievement have been conducted with normal hearing subjects. The evidence is rather conclusive for the relationship between self-concept and achievement, with better achievers generally having high self-concept (Coopersmith, 1967; Gowan, 1960). The evidence for the relationship between locus of control and achievement is not as

conclusive. McGhee and Crandall (1966) found high school internals obtained higher grades than did high school externals. Other studies (Daniels & Stevens, 1976; McLaughlin, 1981; Parent, Forward, Canter, & Mohling, 1975) have found interactions between locus of control and instructional conditions, with externals performing better in high-structure conditions (teacher directed, programmed instruction), and internals performing better in low-structure conditions (student controlled, discovery methods). When locus of control and self-concept have been studied together, the correlations between the two have been low to moderate with a tendency for individuals with higher self-concept to be more internally controlled (Fish & Karabenich, 1971; Lambert, DiJulio, & Cole, 1976).

When achievement has been used as a dependent variable in research with deaf subjects, aptitude or ability predictors ordinarily have been employed. The research that has been involved with the self-concept and locus of control of deaf subjects has been focused more on the former, and has generally examined differences between deaf and hearing groups, or between subgroups of deaf subjects. The findings of this research have suggested that, in comparison to hearing subjects, deaf subjects tend to be more externally controlled (Blanton & Nunnally, 1964; Bodner & Johns, 1977) and to have lower self-concept (Garrison & Tesch, 1978; Garrison, Tesch, & DeCaro, 1978). Furthermore, in comparison to deaf students born to hearing parents, deaf students born to deaf parents have higher self-acceptance and are better achievers (Meadow, 1969; Schlesinger & Meadow, 1972).

Problems with syntax that impede the understanding of written and spoken English by deaf students have been identified in research by

Quigley and his associates (Jones & Quigley, 1979; Power & Quigley, 1973; Quigley, Montanelli, & Wilbur, 1976; Quigley, Smith, & Wilbur, 1974; Steinkamp & Quigley, 1977; Wilbur, Quigley, & Montanelli, 1975) and others (Cooper, 1967; Garrison, Tesch, & DeCaro, 1978; Perry, 1968; Rudner, 1978). These problems include: deviations from normal subject-verb-object order, passive voice, complicated verb constructions, implied or double negatives, medial clauses especially due to complements and relatives, low information pronouns, conditionals, comparatives and items where the referrent is not mentioned, idioms, inferentials, slang, and words with restricted or limited interpretations. It is likely that some of these problems occur in existing locus of control and self-concept instruments, as well as in other instrumentation used with deaf subjects. For example, both Bodner and Johns (1977) and Garrison, Tesch, & DeCaro (1978) found interactions between reading comprehension and the performance of deaf subjects on the Rotter Locus of Control Scale and the Tennessee Self-Concept Scale, respectively. These interactions were evidenced by higher reliability estimates for the better readers in their respective samples than for the entire sample. In conducting follow-up interviews, Garrison, Tesch, & DeCaro (1978) found that many items on the Tennessee Self-Concept Scale were not adequately understood by the deaf students in the study.

While efforts have been made to develop strategies to determine if items on achievement tests are biased to deaf subjects (Rudner & Convey, 1978), no attempts appear to have been made to eliminate problematic structures from existing instruments when used with deaf populations. If the presence of certain structures is

helping to attenuate the relationship between locus of control, self-concept, and achievement in studies using deaf subjects, better prediction should result if these structures are eliminated from instruments without changing what is being measured.

Method

Sample

Ninety deaf adolescents, ages 13 to 19, from four residential schools for the deaf in different states participated in the study. Only students who had lost their hearing prior to the age of two, had a maximum correctable loss of 70 db in the better ear, had no neurological complications, and had a WISC IQ or comparable IQ of 70 or greater were included in the study. All students in the four schools who had deaf parents were included since this number was small. The remaining students were randomly sampled from the available pool of students with hearing parents. Usable achievement data were obtained for 76 students, twelve of whom had deaf parents. The average age of these 76 students was 16.

Instruments

The achievement data came from the Special Edition of the Stanford Achievement Test for Hearing Impaired Students (SAT-HI). The SAT-HI was developed in 1973 by the Office of Demographic Studies at Gallaudet College by adjusting or recombining the subtests within the full battery of all levels of the regular Stanford Achievement Test (SAT), so that students receive reading subtests suitable to their ability along with generally higher level subtests in math and spelling. Level 1 (primary) and Level 6 (advanced) of the

SAT-HI are the same as the corresponding levels of the SAT. Level 2 through Level 5 have differently arranged levels of subtests. Since the students did not all take the same level of the SAT-HI, scaled scores were used so that scores from different levels could be compared. The subtests used were vocabulary, reading comprehension, math concepts, math computation, math applications, spelling, language, social science, and science.

The Rotter Locus of Control Scale was used to measure locus of control, and the Piers-Harris Children's Self-Concept Scale was used to measure self-concept. The Rotter scale is a 29 item self report inventory with a forced choice format and containing six filler items. Each item consists of two statements, one with an external orientation and the other with an internal orientation. Scores range from 0 (most internal) to 23 (most external). The Rotter is commonly used to measure locus of control with adolescents.

The Piers-Harris Children's Self-Concept Scale contains 80 first person declarative statements, approximately half of which are worded positively and half worded negatively. The response scale consists of a yes-no format. The relatively easy reading level of the Piers-Harris and the appropriateness of the standardization sample (grades 3 to 12) prompted the selection of this instrument for use with the hearing-impaired subjects in this study.

Procedures

A content analysis of the Rotter and the Piers-Harris was conducted based on the twelve rules for item editing given in Table 1. Any item having a violation of any of these rules was revised. For the Rotter, 114 violations were noted, resulting in the revision of

all 23 non-filler items. For the Piers-Harris, 30 violations were noted, resulting in the revision of 28 of the 80 items. The most prevalent violations involved medial clauses or other types of subject-verb-object violation, idioms that were judged not likely to be familiar to the hearing-impaired adolescent, and words with restricted interpretation.

Insert Table 1 about here

The modified instruments were first administered in a pilot study to 24 deaf students from a residential school not included in the study. An item analysis of each instrument revealed that the modified Piers-Harris was performing satisfactorily (coefficient alpha = .80), while the modified Rotter was not (coefficient alpha = -.13). The average p-value for the Piers-Harris was .64, resulting in a mean of 51.00 for the 24 students; the average p-value for the Rotter was .49 (i.e., the percentage of respondents choosing an external alternative), resulting in a mean of 11.33 for the group. Eleven items on the modified Piers-Harris and six items on the modified Rotter had negative point-biserial correlations. These items were reexamined and several of them revised. It is likely that the small number of subjects in this pilot contributed to the relative instability of the item parameters, especially for the modified Rotter which was much shorter than the modified Piers-Harris.

Insert Table 2 about here

In order to determine the extent to which the modifications made to the instruments would change the performance of normal hearing

students, a second pilot study was conducted in which 20 hearing adolescents were given both forms of the Piers-Harris and 41 hearing adolescents were given both forms of the Rotter. All hearing students were from grades 11 and 12. The administration of the instruments was counterbalanced, and they were given one week apart. Table 2 presents a summary of the results of these administrations. The total scores on the Piers-Harris were rather stable from form to form with the tendency for subjects to have slightly higher self-concept scores on the modified form. The estimates of coefficient alpha for each form were high, and the correlation of .89 between forms indicates excellent equivalence. On the Rotter, the students scored significantly more internally on the modified form than on the original form. The lower internal consistency estimate for the modified form could be due to the more homogeneous responding of the group over the entire instrument. An item by item comparison from form to form of the Rotter indicated two items on which more than 50% of the respondents switched from an external alternative to an internal alternative. Ten other items had a moderate amount of instability from form to form. The change on three items was from external to internal, on three others from internal to external, and mixed on the remaining four. The net result was a modified form of the Rotter on which the examinees tended to choose more internal alternatives than on the original form. The correlation between the two forms was .59, indicating an unsatisfactory amount of equivalence. Thus, it appears that what was being measured by the modified form of the Rotter differed somewhat from what was being measured by the original form for the hearing subjects in the pilot.

The original and modified forms of each instrument were then administered to the subjects in the four residential schools using a counterbalanced design at an interval of one week. The directions for the instruments were supplemented by manual communication when necessary, and interpreters addressed any questions the subjects had prior to taking the instruments. Data concerning parent hearing status, age, sex, and subscale performance on the SAT-HI were provided by each school. All information was obtained in such a way so that the anonymity of the students was preserved.

Data Analysis

Two separate regression analyses, one using the scores from the modified instruments and the other using the scores from the original instruments, were conducted for each subscale on the SAT-HI. The predictors in each analysis were the Rotter score, the Piers-Harris score, parent hearing status, age, sex, and school. A forward regression procedure was employed to enter the variables into the model. The R^2 for each model for each dependent variable was compared, as well as the relative importance of the predictors in each model. The latter was assessed both by the increase in R^2 as the predictor entered the model and by the beta weight of the predictor in the full model.

Results

A summary of the performance of the deaf subjects on the original and modified instruments is given in Table 3. The modifications resulted in a slightly higher self-concept score and a more internal locus of control score, as occurred for the hearing subjects in the pilot study; however, the change in the Rotter score was not

as great as for the hearing subjects. The internal consistency estimate for each form and the correlation between the forms were substantial for the Piers-Harris, but quite low for the Rotter. However, the internal consistency estimate for the modified Rotter was higher than that for the original Rotter, and also higher than that for the modified Rotter when given to the deaf subjects in the first pilot study. Thus, both forms of the Piers-Harris appear to be psychometrically sound, while the forms of the Rotter are less so. The modifications made to the Rotter seemed to have had a more individually differential effect on the performance of the deaf subjects and a more consistent effect on the performance of the hearing subjects. This is evidenced by greater equivalence between the forms of the Rotter for the hearing subjects than for the deaf subjects, even though the means from form to form changed more for the hearing subjects.

Insert Table 3 about here

Insert Table 4 about here

The means, standard deviations, and correlations among the variables for the 76 subjects with usable achievement data are given in Table 4. The modified Rotter had higher zero-order correlations with the dependent variables than did the original Rotter, however the converse was so for the Piers-Harris. Parent hearing status had substantial zero-order correlations will all the dependent variables, and moderate, but significant, correlations with the modified Rotter and the original Piers-Harris. From Table 5, it is evident that

the deaf students with deaf parents in this study were better achievers, were more internally controlled, and had higher self-concept when compared to the deaf students with hearing parents in this study.

Insert Table 5 about here

The intercorrelations among the dependent variables were substantial as expected. Age predicted math performance better than it predicted performance on the other subtests, and sex had higher correlations with the non-math subtests than with the math subtests. Females significantly outperformed males on the non-math subtests, but there were no significant differences on the math subtests between males and females even though the female mean was higher. There were also no significant difference between males and females on the original and modified forms of the Rotter and the Piers-Harris.

Insert Table 6 about here

The results of the regression analyses are given in Table 6. Better prediction was obtained for six of the subscales of the SAT-HI when scores from the modified instruments were used in place of scores from the original instruments. The increase in prediction ranged from .011 (3.5% increase) for the math applications subtest to .149 (32.3% increase) for the language subtest. Subtests for which the prediction was not better when modified scores were used were math computation (down .016 or 6.8%), science (down .013 or 3.4%), and social science (down .012 or 3.0%). For all analyses, parent hearing status was a significant predictor of achievement, and most often was the most important predictor. When scores from the original instruments were

used, self-concept was a significant predictor of achievement for all subtests except language, while locus of control was significant only for the vocabulary subtest. When scores from the modified instruments were used, self-concept was a significant predictor for all subtests, and locus of control was a significant predictor for five subtests: vocabulary, reading comprehension, math concepts, spelling, and language. It is evident that the increase in prediction that occurred when scores from the modified instruments were used in the model was due to the locus of control variable. Sex was an important predictor of vocabulary, spelling, language, social science, and science. Age and school were important only for the language subtest.

Discussion

The improvement in prediction that resulted when the modified form of the Rotter was used as a predictor in place of the original form of the Rotter is striking. Every item of the original form of the Rotter had to be revised because of a syntactical or vocabulary problem. On the other hand, the original form of the Piers-Harris scale required comparatively few revisions, and these had very little effect on the reliability of the instrument and on its prediction of achievement. On the basis of the data in this study, it is not possible to determine whether the increase in prediction was due solely to the extensive modifications of the original form of the Rotter. However, the fact remains that the modified form of the instrument was a better predictor of achievement than was the original form. The presence of syntactical structures

that would seriously interfere with the ability of a deaf student fully to comprehend an item would seem to lead to an increase in measurement error, since items with such structures would tend to encourage random responding on the part of the examinee. This increase in measurement error will attenuate the relationship between measures containing such structures and other measures. How seriously the presence of these structures in the orginial form of the Rotter interfered with the comprehension of the items by the deaf students in this study is not known. What is known is that the problem was extensive.

It is possible that the gains in the predictive validity of the Rotter relative to achievement were achieved at the expense of the content validity of the instrument. This was evidenced by the tendency of the hearing subjects to score more internally on the modified form of the Rotter than on the original form, when in theory the changes made to the items should not have substantially changed the meaning of the items for the hearing subjects, and thus not change their performance. Since the deaf subjects also had a tendency to score in a more internal manner on the modified form of the Rotter although not as much as the hearing subjects, it is possible that the revisions resulted in a different sampling of items from the domain. If the sampling of items ceased to be representative, then a problem with content validity would result. If the meaning of the items were changed substantially so that possibly a different domain was being sampled, a problem with construct validity would result. It is not likely that this happened.

Self-concept was a stronger predictor of achievement than was locus of control. This was especially true when the original forms of the instruments were used in the model. The correlations between self-concept and achievement obtained with the deaf subjects in this study were very similar to those found in studies with normal hearing subjects, thus supporting the conclusion that generally better achievers have a higher self-concept than do poorer achievers. The hearing subjects used in the pilot study scored higher than the deaf subjects on both forms of the Piers-Harris; however, these differences were not statistically significant. This finding somewhat parallels the finding of Garrison, Tesch, & DeCaro (1978); however, the level of self-concept of the deaf students used in this study was not nearly as negative as the level of the students in their study. The primary reason could be due to the instrumentation used in each study. The Piers-Harris scale required only minor modifications and produced good results with the students in its original form. On the other hand, the Tennessee Self-Concept Scale used by Garrison, Tesch, & DeCaro seemed to be plagued by numerous syntactical complexities similar to those present in the Rotter scale. Thus, the measures of self-concept obtained in this study may be better indicators of the self-concept of deaf students than were those obtained in their study.

The modified form of the Rotter was a significant predictor of the achievement subtests which generally relied on language proficiency. Internals scored better on these subtests than did externals. The hearing subjects used in the pilot study had a

mean score indicative of a more internal orientation than was the mean score of the deaf subjects; however, the difference was significant only when the modified form of the Rotter was used. That hearing subjects were more internal than deaf subjects is consistent with the findings of Blanton and Nunnally (1964) and Bodner and Johns (1977). However, it would be a mistake to characterize the deaf students in this study as being external as a group, since the mean for these subjects on the original form of the Rotter was at about the median for subjects used in previous research with this instrument (Rotter, 1971).

Deaf students with deaf parents had higher self-concepts, were more internally controlled, and were better achievers than the deaf students with hearing parents. The self-concept and achievement findings agree with the research of Meadow (1969) and Struckless and Birch (1966). Meadow (1976) indicated that early communicative training is the crucial reason for the superior performance of these students. Early communication minimizes the isolation that might accompany a severe hearing impairment from birth, and facilitates important interaction between the parents and the child at a crucial stage of development. Also, since language development is not unduly delayed for these children, the likelihood increases that the development of language skills for deaf children with deaf parents will parallel the development of language skills for normal hearing children. In addition, it appears that deaf children born to deaf parents experience greater parental acceptance than do deaf children born to hearing parents (Hardy & Cull, 1974). This greater acceptance

probably encourages the child to develop a more wholesome self-image.

Differences between subgroups of deaf students in terms of locus of control have not been investigated before. Deaf students with deaf parents could have been more internally controlled than those with hearing parents because of greater emphasis placed on self-reliance by their parents. Certainly such a child rearing practice should encourage greater independence leading to a more successful manipulation of the environment and a belief in personal versus external control.

The findings of this study have implications for researchers and teachers of the deaf. For researchers, there is a need to develop instrumentation for use with deaf populations which avoids certain syntactical structures. When existing instrumentation that has been developed with hearing subjects is to be used with deaf subjects, such instrumentation should be selected not only on the basis of its psychometric properties, but also on the basis of its language and syntax. If necessary, existing instrumentation should be revised, especially if the number of problematic structures is relatively large. It is likely that revising such instrumentation will result in better measurement of deaf examinees. Also, researchers should be aware of the importance of parent hearing status as an intervening variable when predicting achievement outcomes of deaf adolescents.

It is important for educators of deaf children to be aware that self-concept and locus of control are related to achievement outcomes. Research by Carlton and Moore (1966) on self-concept and DeCharms (1968)

on personal control versus control by others suggests that the psychosocial outlook of culturally disadvantaged children can be ameliorated to some extent by programs designed for this purpose. At this time, no findings are available as to how these traits could be improved for hearing impaired students through either formal or informal means. Whether or not future research with others groups of deaf children continues to show the importance of these variables in relationship to achievement, the development of ways to help deaf children come to a more positive self-concept and a greater sense of personal control would seem to warrant special attention by educators and researchers alike.

In summary, this study presented an example of how modifying an existing instrument by removing certain syntactical structures that have been found difficult for deaf persons to comprehend resulted in increased prediction of achievement outcomes. Also presented was an example of an instrument for which modifications made little difference in prediction. The difference between the two instruments involved the number of structures that had to be modified rather than the type of structure. The Rotter scale needed complete revision, and the result was better prediction. The Piers-Harris scale needed minor revisions, and little change in prediction resulted. More research is needed on the extent to which certain syntactical structures interfere with the measurement of deaf examinees. Also, further work is needed to determine how successfully prediction can be increased or measurement improved by removing certain structures from instruments designed for use with deaf populations.

References

Blanton, R. L., & Nunnally, J. C. Semantic habits and cognitive style processes in the deaf. Journal of Abnormal and Social Psychology, 1964, 68, 379-402.

Bodner, B. A., & Johns, J. Personality and hearing impairment: A study in locus of control. The Volta Review, 1977, 79, 362-372.

Carlton, L., & Moore, R. H. The effects of self-directed dramatization on reading achievement and self-concept of culturally disadvantaged children. Reading Teacher, 1966, 20, 125-130.

Cooper, R. The ability of deaf and hearing children to apply morphological rules. Journal of Speech and Hearing Research, 1967, 10, 77-86.

Coopersmith, S. The antecedents of self-esteem. San Francisco: W. H. Freeman & Co., 1967.

Daniels, R. L., & Stevens, J. P. The interaction between the internal-external locus of control and two methods of college instruction. American Educational Research Journal, 1976, 13, 103-113.

DeCharms, R. Personal causation: The internal affective determinants of behavior. New York: Academic Press, 1968.

Fish, B., & Karabenick, S. A. Relationship between self-esteem and locus of control. Psychological Reports, 1971, 29, 784.

Garrison, W. M., & Tesch, S. Self-concept and deafness: A review of of research literature. The Volta Review, 1978, 80, 457-466.

Garrison, W. M., Tesch, S., & DeCaro, P. An assessment of self-concept levels among post-secondary deaf adolescents. American Annals of the Deaf, 1978, 123, 968-975.

Gowan, J. C. Factors of achievement in high school and college. Journal of Counseling Psychology, 1960, 7, 91-95.

Hardy, R. E., & Cull, J. G. Severe disabilities: Social and rehabilitation approaches. Springfield, Ill.: Charles C. Thomas, 1974.

Jones, B. W., & Quigley, S. P. A study of complementation in the language of deaf and hearing subjects. American Annals of the Deaf, 1979, 124, 23-29.

Lambert, M. J., DiJulio, S. S., & Cole, A. M. Internality versus externality and personal adjustment: A factor analytic study. Psychological Reports, 1976, 39, 920-922.

McGhee, P. E., & Crandall, V. C. Beliefs in internal-external control of reinforcements and academic performance. Child Development, 1968, 39, 91-102.

McLaughlin, B. An experimental comparison of discovery and didactic computerized instructional strategies in the learning of computer programming. Unpublished doctoral dissertation, The Catholic University of America, 1981.

Meadow, K. P. Self-image, family climate, and deafness. Social Forces, 1969, 47, 428-438.

Meadow, K. P. Personality and social development of deaf persons. Journal of Rehabilitation of the Deaf, 1976, 9, 1-12.

Parent, J., Forward, J., Canter, R., & Mohling, J. Interactive effects of teaching strategy and personal locus of control on student performance and satisfaction. Journal of Educational Psychology, 1975, 67, 764-769.

Perry, F. R. The psycholinguistic abilities of deaf children: An exploratory investigation-II. The Australian Teacher of the Deaf, 1968, 9, 153-160.

Power, D. J., & Quigley, S. P. Deaf children's acquisition of the passive voice. Journal of Speech and Hearing Research, 1973, 16, 5-11.

Quigley, S. P., Montanelli, D. S., & Wilbur, R. B. Some aspects of the verb system in the language of deaf students. Journal of Speech and Hearing Research, 1976, 19, 536-550.

Quigley, S. P., Smith, N. L., & Wilbur, R. B. Comprehension of relativized sentences by deaf students. Journal of Speech and Hearing Research, 1974, 17, 699-713.

Rotter, J. B. External control and internal control. Psychology Today, June, 1971, 37-42, 58-59.

Rudner, L. M. Using standardized tests with the hearing impaired: The problem of item bias. The Volta Review, 1978, 80, 31-40.

Rudner, L. M., & Convey, J. J. An evaluation of select approaches for biased item identification. Presented to the annual meeting of the American Educational Research Association, Toronto, April, 1978. (ERIC Document Reproduction Service No. ED 157 942).

Schlesinger, H. S., & Meadow, K. P. Sound and sign: Childhood deafness and mental health. Berkeley: University of California Press, 1972.

Steinkamp, M., & Quigley, S. P. Assessing deaf children's written language. The Volta Review, 1977, 79, 10-18.

Struckless, R. E., & Birch, J. W. The influence of early manual communication on the linguistic development of deaf children. American Annals of the Deaf, 1966, 111, 452-460.

Wilbur, R. B., Quigley, S. P., & Montanelli, D. S. Conjoined structures in the language of deaf students. Journal of Speech and Hearing Research, 1975, 18, 319-335.

Table 1

Rules for Item Editing

1. Subject-verb-object order is mandatory.
2. Avoid complicated verb constructions.
3. Avoid passive voice.
4. Avoid double or implied negatives.
5. Avoid complements, particularly in the middle of a sentence.
6. Avoid relative clauses, particularly in the middle of a sentence.
7. Avoid pronouns that convey minimal information.
8. Avoid sentences containing conditionals.
9. Avoid comparatives and phrases where the referrent is not mentioned.
10. Avoid inferentials or words that qualify an intended meaning.
11. Avoid idiomatic or slang expressions.
12. Avoid words with restricted or limited interpretation.

Table 2

Summary of the Performance of the Hearing Students on Both Forms of the Instruments

	Piers-Harris		Rotter	
	Original	Modified	Original	Modified
Mean	55.05	55.70	9.78	6.95
S.D.	9.36	8.54	3.96	2.76
Alpha	.85	.83	.78	.58
n	20		41	
r	.89		.59	

Table 3

Summary of the Performance of the Deaf Students on Both Forms of the Instruments

	Piers-Harris		
	Original		Modified
Mean	51.99		52.91
S.D.	9.66		9.54
Alpha	.84		.84
n		90	
r		.82	

	Rotter		
	Original		Modified
Mean	10.70		10.56
S.D.	2.77		2.70
Alpha	.20		.31
n		90	
r		.17	

Table 4

Correlations, Means, and Standard Deviations for all Variables

Variable	1.	2.	3.	4.	5.	6.	7.	8	9	10	11	12	13	14	15	16	n	Mean	S.D.
1. Mod Rotter	-																76	10.29	2.74
2. Orig Rotter	23	-															76	10.59	2.58
3. Mod Piers-Harris	-18	-33	-														76	53.00	9.94
4. Org Pibrs-Harris	-18	-24	82	-													76	51.93	9.94
5. Parent Status[a]	-25	-14	18	30	-												76	.16	.37
6. Age	-19	-16	11	14	16	-											72	16.08	1.51
7. Sex[b]	-09	-20	-05	02	22	-09	-										73	1.47	.50
8. Vocabulary	-40	-31	34	43	44	-01	31	-									76	122.30	30.88
9. Read Compreh	-40	-22	40	48	47	07	24	92	-								74	142.68	25.06
10. Math Concepts	-37	-20	42	50	42	23	19	87	90	-							76	152.22	28.13
11. Math Computation	-17	-16	27	35	39	22	18	73	73	79	-						76	171.96	28.90
12. Math Application	-29	-08	31	38	47	14	18	85	90	90	83	-					72	145.00	32.51
13. Spelling	-37	-22	29	42	40	04	34	88	87	85	75	83	-				72	168.60	24.11
14. Language	-40	-15	36	28	49	-05	25	68	64	72	62	72	76	-			45	162.44	21.08
15. Social Science	-28	-20	34	44	50	07	33	90	94	91	79	90	86	72	-		64	146.42	29.81
16. Science	-29	-16	29	42	53	05	30	85	91	87	79	89	86	65	92	-	64	140.61	40.08

[a] 0-hearing parent; 1-deaf parent.

[b] 1-male; 2-female.

Table 5

Means, Standard Deviations, Sample Sizes, and t-Test Results for Sex and Parent Hearing Status for all Variables

Variable		Male	Female	p	Hearing	Deaf	p
Mod Rotter	$\bar{X}$	10.51	10.03	.463	10.58	8.75	.033
	s	2.52	3.07		2.58	3.14	
	n	39	34		64	12	
Orig Rotter	$\bar{X}$	11.03	10.00	.086	10.75	9.75	.220
	s	2.17	2.85		2.67	1.91	
	n	39	34		64	12	
Mod Piers-Har	$\bar{X}$	53.51	52.41	.645	52.23	57.08	.122
	s	9.00	11.32		10.21	7.40	
	n	39	34		64	12	
Orig Piers-Har	$\bar{X}$	51.74	52.06	.896	50.64	58.83	.008
	s	9.21	11.24		10.01	6.15	
	n	39	34		64	12	
Vocabulary	$\bar{X}$	112.90	131.79	.008	116.52	153.17	.001
	s	26.06	32.78		28.83	22.55	
	n	39	34		64	12	
Reading Comp	$\bar{X}$	136.26	148.47	.038	137.56	169.08	.001
	s	23.56	25.48		22.89	18.81	
	n	39	34		64	12	
Math Concepts	$\bar{X}$	146.49	156.76	.113	147.16	179.25	.001
	s	26.20	28.57		26.69	19.24	
	n	39	34		64	12	
Math Comput	$\bar{X}$	167.31	177.09	.137	167.25	197.08	.001
	s	30.66	23.77		26.74	21.68	
	n	39	34		64	12	
Math Applic	$\bar{X}$	138.38	149.94	.140	138.15	179.25	.001
	s	34.63	28.72		30.12	20.49	
	n	37	32		60	12	
Spelling	$\bar{X}$	160.38	176.88	.004	164.28	190.17	.001
	s	22.42	23.67		22.89	18.23	
	n	37	32		60	12	

Table 5

(continued)

Variable		Male	Female	p	Hearing	Deaf	p
Language	$\bar{X}$	155.35	166.08	.001	156.62	180.45	.001
	s	15.51	23.44		17.29	22.27	
	n	17	26		34	11	
Social Scien	$\bar{X}$	136.31	155.66	.010	139.68	178.91	.001
	s	29.87	26.00		27.61	15.16	
	n	32	29		53	11	
Science	$\bar{X}$	128.03	151.69	.020	130.96	187.09	.001
	s	43.07	33.24		36.04	22.26	
	n	32	29		53	11	

Table 6

Overall R^2, and R^2 Change and Beta for Each Predictor for Each Dependent Variable

			Modified Form								Original Form					
Variable	R^2		PAR	ROT	P-H	SEX	AGE	SCH	R^2		PAR	ROT	P-H	SEX	AGE	SCH
Vocabulary	406	Change	190*	092*	051*	054*	012	006	388	Change	190*	021*	100*	056*	021	011
		Beta	270	-294	271	237	-120	-082		Beta	264	-185	336	210	-116	-111
Reading Comprehension	419	Change	218*	065*	105*	027	002	001	374	Change	115*	003	227*	027	001	003
		Beta	309	-269	316	171	-047	-039		Beta	305	-065	376	162	-027	-052
Math Concepts	386	Change	175*	053*	120*	014	015	009	373	Change	080*	001	246*	018	016	011
		Beta	237	-224	336	155	119	-096		Beta	218	-038	414	150	135	-115
Math Computation	235	Change	152*	000	043*	018	021	001	251	Change	152*	001	061*	016	019	002
		Beta	286	-021	211	141	160	-029		Beta	248	-026	257	132	150	-055
Math Applications	327	Change	225*	022	054*	013	001	013	316	Change	225*	002	060*	012	002	015
		Beta	344	-157	236	121	030	-132		Beta	337	051	294	131	055	-133
Spelling	357	Change	162*	080*	046*	062*	003	004	345	Change	049*	004	174*	112*	001	005
		Beta	234	-264	231	282	-055	-069		Beta	221	-073	345	279	-040	-088
Language	611	Change	242*	109*	069*	039*	051*	102*	462	Change	242*	010	040	046	022	102*
		Beta	281	-333	303	208	-208	-434		Beta	334	-110	228	184	-170	-421
Social Science	398	Change	251*	014	066*	063*	001	004	410	Change	251*	001	093*	059*	001	006
		Beta	357	-132	276	260	-026	-063		Beta	327	-040	344	252	-024	-087
Science	383	Change	284*	016	039*	042*	002	001	396	Change	284*	000	072*	039*	001	000
		Beta	431	-135	202	193	-041	031		Beta	407	000	293	197	-032	015

* $p < .05$